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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/132,157	08/11/98	FORBES	L 303.229US2

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EXAMINER

PRENTY, M

ART UNIT	PAPER NUMBER
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2822

21

DATE MAILED: 10/30/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/132,157

Applicant(s)

FORBES

Examiner

Prenty

Group Art Unit

2822



☒ Responsive to communication(s) filed on Oct 20, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 11, 13, 14, 24-28, 30-32, and 38-43 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 11, 13, 14, 24-28, 30-32, and 38-43 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

This Office Action is in response to the amendment filed October 20, 2000.

Claims 11, 13, 14, 24-28, 30-32 and 38-40¹ are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in this art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, the specification does not enable a transistor having a channel length less than 7 μ m.

Claim 41 is rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. (United States Patent 5,426,069 already of record) together with Aronowitz et al. (United States Patent 5,296,386 already of record). Specifically, the difference between Selvakumar et al's metal-oxide-semiconductor (i.e., MOS) transistor (see Selvakumar et al's Figures 1-7 disclosure in particular) and the claimed MOS transistor is they are N-type and P-type, respectively. ² Aronowitz et al. teaches silicon-germanium (i.e., SiGe) channel regions in both N-type and P-type MOS transistors (see Aronowitz et al's Abstract, for example). It would have been obvious to one skilled in this art to extend Selvakumar et al's N-type MOS transistor with SiGe channel disclosure to a P-type MOS transistor as suggested by Aronowitz et al. Claim 41 is thus rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. together with Aronowitz et al.

Claims 42 and 43 are rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. (United States Patent 5,426,069 already of record) together with Aronowitz et al. (United States Patent 5,296,386 already of record) and Crabbe' et

¹ Claims 41-43 do not recite a channel length.

² It could be argued that there is no difference between Selvakumar et al's MOS transistor and claim 41's "p-channel" MOS transistor on the ground that a claim's preamble is generally not given patentable weight. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976).

al. (United States Patent 5,821,577 already of record). Specifically, the difference between the obvious Selvakumar et al. / Aronowitz et al. transistor and the transistor recited in the set of rejected claims is that the latter's SiGe channel thickness is unknown while the former's SiGe channel thickness is "approximately 100 to 1,000 angstroms" (claim 42) or "approximately 300 angstroms" (claim 43). Crabbe' et al. discloses forming SiGe channels 100 to 500 angstroms thick (see column 6, lines 17-22). It would have been further obvious to one skilled in this art to make the obvious Selvakumar et al. / Aronowitz et al. transistor's channel 100 to 500 angstroms thick as suggested by Crabbe' et al. Claims 42 and 43 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. together with Aronowitz et al. and Crabbe' et al.

Claims 11, 24, 25, 30 and 32 are rejected under 35 U.S.C. §103(a) as being unpatentable over Aronowitz et al. (United States Patent 5,296,386 already of record) together with Grider et al. (United States Patent 5,818,100 already of record). Specifically, the difference between Aronowitz et al. (see Aronowitz et al's Figure 1 disclosure in particular) and the set of rejected claims is the former's channel length is not disclosed while the latter's channel length is less than $7\mu\text{m}$. Grider et al. teach that channel lengths are conventionally less than $7\mu\text{m}$ (see Grider et al. at column 1, lines 22-37). It would have been obvious to one skilled in this art to form Aronowitz et al's channel length less than $7\mu\text{m}$ as evidenced by Grider et al. Claims 11, 24, 25, 30 and 32 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Aronowitz et al. together with Grider et al.

Claims 13, 26, 27 and 31 are rejected under 35 U.S.C. §103(a) as being unpatentable over Aronowitz et al. (United States Patent 5,296,386 already of record)

together with Grider et al. (United States Patent 5,818,100 already of record) and Crabbe' et al. (United States Patent 5,821,577 already of record). Specifically, the difference between the obvious Aronowitz et al. / Grider et al. transistor (see above) and the transistor recited in the set of rejected claims is that the latter's SiGe channel thickness is unknown while the former's SiGe channel thickness is "approximately 100 to 1,000 angstroms" (claims 13, 26 and 31) or "approximately 300 angstroms" (claim 27). Crabbe' et al. discloses forming SiGe channels 100 to 500 angstroms thick (see column 6, lines 17-22). It would have been further obvious to one skilled in this art to make the obvious Aronowitz et al. / Grider et al. transistor's channel 100 to 500 angstroms thick as suggested by Crabbe' et al. Claims 13, 26, 27 and 31 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Aronowitz et al. together with Grider et al. and Crabbe' et al.

Claims 11, 24, 25, 30 and 32 are rejected under 35 U.S.C. §103 as being unpatentable over Aronowitz et al. (United States Patent 5,296,386 already of record) together with Wolf (cited in the Information Disclosure Statement filed March 18, 1999). Specifically, the difference between Aronowitz et al. (see Aronowitz et al's Figure 1 disclosure in particular) and the set of rejected claims is the former's channel length is not disclosed while the latter has a channel length of less than $7\mu\text{m}$. Wolf teaches that channel lengths are conventionally less than $7\mu\text{m}$ (see the entire reference). It would have been obvious to one skilled in this art to form Aronowitz et al's channel length less than $7\mu\text{m}$ as evidenced by Wolf. Claims 11, 24, 25, 30 and 32 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Aronowitz et al. together with Wolf.

Claims 13, 26, 27 and 31 are rejected under 35 U.S.C. §103(a) as being unpatentable over Aronowitz et al. (United States Patent 5,296,386 already of record) together with Wolf (cited in the Information Disclosure Statement filed March 18, 1999) and Crabbe' et al. (United States Patent 5,821,577 already of record). Specifically, the difference between the obvious Aronowitz et al. / Wolf transistor (see above) and the transistor recited in the set of rejected claims is that the latter's SiGe channel thickness is unknown while the former's SiGe channel thickness is "approximately 100 to 1,000 angstroms" (claims 13, 26 and 31) or "approximately 300 angstroms" (claim 27). Crabbe' et al. discloses forming SiGe channels 100 to 500 angstroms thick (see column 6, lines 17-22). It would have been further obvious to one skilled in this art to make the obvious Aronowitz et al. / Wolf transistor's channel 100 to 500 angstroms thick as suggested by Crabbe' et al. Claims 13, 26, 27 and 31 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Aronowitz et al. together with Wolf and Crabbe' et al.

Claims 11, 14, 24, 25, 28, 30, 32, 38 and 40 are rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. (United States Patent 5,426,069 already of record) together with Aronowitz et al. (United States Patent 5,296,386 already of record) and Grider et al. (United States Patent 5,818,100 already of record). Specifically, the difference between the obvious Selvakumar et al. / Aronowitz et al. transistor (see the 35 U.S.C. §103(a) rejection of claim 41 above) and the transistor recited in the set of rejected claims is the former's channel length is $7\mu\text{m}$ (as per Selvakumar et al.) while the latter's channel length is less than $7\mu\text{m}$. Grider et al. teach that channel lengths are conventionally less than $7\mu\text{m}$ (see Grider et al. at column 1, lines 22-37). It would have been further obvious to one skilled in this art to

form the obvious Selvakumar et al. / Aronowitz et al. transistor with a channel length less than $7\mu\text{m}$ as evidenced by Grider et al. Claims 11, 14, 24, 25, 28, 30, 32, 38 and 40 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. together with Aronowitz et al. and Grider et al.

Claims 13, 26, 27, 31 and 39 are rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. (United States Patent 5,426,069) together with Aronowitz et al. (United States Patent 5,296,386 already of record), Grider et al. (United States Patent 5,818,100 already of record) and Crabbe' et al. (United States Patent 5,821,577 already of record). Specifically, the difference between the obvious Selvakumar et al. / Aronowitz et al. / Grider et al. transistor (see above) and the transistor recited in the set of rejected claims is that the latter's SiGe channel thickness is unknown while the former's SiGe channel thickness is "approximately 100 to 1,000 angstroms" (claims 13, 26, 31 and 39) or "approximately 300 angstroms" (claim 27). Crabbe' et al. discloses forming SiGe channels 100 to 500 angstroms thick (see column 6, lines 17-22). It would have been further obvious to one skilled in this art to make the obvious Selvakumar et al. / Aronowitz et al. / Grider et al. transistor's channel 100 to 500 angstroms thick as suggested by Crabbe' et al. Claims 13, 26, 27, 31 and 39 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. together with Aronowitz et al., Grider et al. and Crabbe' et al.

Claims 11, 14, 24, 25, 28, 30, 32, 38 and 40 are rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. (United States Patent 5,426,069 already of record) together with Aronowitz et al. (United States Patent 5,296,386 already of record) and Wolf (cited in the Information Disclosure Statement filed March 18, 1999). Specifically, the difference between the obvious Selvakumar et

al. / Aronowitz et al. transistor (see the 35 U.S.C. §103(a) rejection of claim 41 above) and the transistor recited in the set of rejected claims is the former's channel length is $7\mu\text{m}$ (as per Selvakumar et al.) while the latter's channel length is less than $7\mu\text{m}$. Wolf teaches that channel lengths are conventionally less than $7\mu\text{m}$ (see the entire reference). It would have been further obvious to one skilled in this art to form the obvious Selvakumar et al. / Aronowitz et al. transistor with a channel length less than $7\mu\text{m}$ as evidenced by Grider et al. Claims 11, 14, 24, 25, 28, 30, 32, 38 and 40 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar together with Aronowitz et al. and Wolf.


Claims 13, 26, 27, 31 and 39 are rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. (United States Patent 5,426,069) together with Aronowitz et al. (United States Patent 5,296,386 already of record), Wolf (cited in the Information Disclosure Statement filed March 18, 1999) and Crabbe' et al. (United States Patent 5,821,577 already of record). Specifically, the difference between the obvious Selvakumar et al. / Aronowitz et al. / Wolf transistor (see above) and the transistor recited in the set of rejected claims is that the latter's SiGe channel thickness is unknown while the former's SiGe channel thickness is "approximately 100 to 1,000 angstroms" (claims 13, 26, 31 and 39) or "approximately 300 angstroms" (claim 27). Crabbe' et al. discloses forming SiGe channels 100 to 500 angstroms thick (see column 6, lines 17-22). It would have been further obvious to one skilled in this art to make the obvious Selvakumar et al. / Aronowitz et al. / Wolf transistor's channel 100 to 500 angstroms thick as suggested by Crabbe' et al. Claims 13, 26, 27, 31 and 39 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. together with Aronowitz et al., Wolf and Crabbe' et al.

The applicant's arguments are moot in view of the new grounds of rejection and/or are unpersuasive for the reasons of record (see Paper 15 mailed February 2, 2000 hereby incorporated by reference). Furthermore, to the limited extent the applicant even argued the maintained rejections of claims 41-43, any such argument is unpersuasive because it is not commensurate in scope with those claims.

Applicant's amendment necessitated the new ground of rejection. Accordingly, THIS ACTION IS MADE FINAL. See M.P.E.P. §706.07(a). Applicant is reminded of the extension of time policy set forth in 37 C.F.R. §1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. §1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

Registered practitioners can telephone examiner Prenty at (703) 308-4939.
All other parties should telephone (703) 308-0956.


Mark V. Prenty
Primary Examiner